

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (canceled)
2. (currently amended): The method as recited in claim 37, wherein said step of applying said film of sacrificial material -comprises applying said film to an effective thickness for removal of said contaminant particles.
3. (currently amended): The method as recited in claim 37, wherein said contaminant particles having have -a size distribution ranging from a smallest diameter to a largest diameter, and wherein said step of applying said film of sacrificial material comprises applying said film to comprises -a thickness between one-tenth of said smallest diameter and twice said largest diameter.
4. (currently amended): The method as recited in claim 37, wherein said step of applying said sacrificial -film of sacrificial material is performed formed -by spraying a solution onto said waferssubstrate and drying a solvent in said solution to form said solid sacrificial film.
5. (currently amended): The method as recited in claim 37, wherein said step of applying said sacrificial -film of sacrificial material is performed formed -by spinning a solution onto said waferssubstrate and drying a solvent in said solution to form said solid sacrificial film.
6. (canceled)

7. (canceled)

8. (currently amended): The method as recited in claim 37, wherein said ~~step of applying said film of sacrificial material~~ film comprises applying a quantity of nitrocellulose.

9. (currently amended): The method as recited in claim 37, wherein said ~~step of applying forming of said sacrificial film of sacrificial material~~ comprises applying a solution of soluble nitrocellulose in a mixture of alcohol and ether.

10. (currently amended): The method as recited in claim 37, wherein said ~~step of applying said film of sacrificial material~~ film comprises applying a quantity of pyroxylin.

11. (currently amended): The method as recited in claim 37, wherein said ~~step of applying said film of sacrificial material~~ film comprises applying a quantity of collodion.

12. (currently amended): The method as recited in claim 37, wherein said ~~exposing transferring of energy~~ step is performed by exposing said sacrificial film to light ~~from an excimer laser~~ having an effective wavelength for removing said sacrificial film.

13. (currently amended): The method as recited in claim 12, wherein said sacrificial film is comprises collodion and said effective wavelength is between about 150 and about 400 nanometers.

14. (currently amended): The method as recited in claim 12, wherein said light ~~from said excimer laser~~ irradiates said wafer substrate at less than about 100 millijoules per square centimeter.

15. (currently amended): The method as recited in claim 37, further comprising the step of providing a flow of vapor across said wafer substrate -while performing said exposing step transferring of energy.

16. (previously presented): The method as recited in claim 15, wherein said flow of vapor is laminar flow.

17. (currently amended): The method as recited in claim 37, further comprising the step of providing a flow of an inert gas across said wafer substrate - while performing said exposing step transferring of energy.

18. (previously presented): The method as recited in claim 17, wherein said inert gas is selected from the list consisting of nitrogen and argon.

19. (previously presented): The method as recited in claim 17, wherein said flow of an inert gas is laminar flow.

20-28 (canceled)

29. (currently amended) A method for removing contaminant particles from a surface of a substrate wafer, comprising the steps of:

transferring said wafer among a plurality of processing stations under computer control in a predetermined sequence starting at an input station and ending at an output station;

identifying and characterizing contaminant particles on said wafer surface at at least one of said processing stations and creating a record of said contaminant particles data for said wafer at said at least one processing station;

transferring said contaminant particles data to a wafer cleaning station;

transferring said wafer to said wafer cleaning station;

a) applying forming a solid film of sacrificial material to on the said wafer surface;

performing cleaning of said wafer, whercin said wafer cleaning station is adapted to selectively shine light at said contaminant particles based on said contaminant particles data and thereby remove said sacrificial film and said contaminant particles; and

transferring of cleaned wafers to an output station.

b) locating said particles on said surface and recording coordinates of each particle; and
c) shining light at said coordinates to selectively remove particles whose coordinates were recorded.

30. (currently amended): The method as recited in claim 29, further comprising the step of providing a flow of an inert gas across said wafer surface while performing said shining step (c)cleaning of said wafer.

31. (currently amended): The method as recited in claim 29, further comprising the step of comparing said coordinates recorded in locating step (b) contaminant particles data with device design data for identifying contaminant particles causing defects critical to device operation for devices manufactured upon said wafer.

32. (currently amended): The method as recited in claim 31 whercin said light is selectively applied only at said coordinates of said defectscontaminant particles critical to device operation and expected to affect device yield.

33. (canceled)

34. (withdrawn) An apparatus comprising:

an apply tool for applying a layer of sacrificial material to a substrate surface;

a measuring tool for locating particles on said surface and recording coordinates of said particles; and
a light for selectively exposing said surface at said recorded coordinates.

35. (canceled)

36. (canceled)

37. (currently amended) : A method of processing a substrate comprising ~~the steps of~~:

a) providing a substrate comprising patterns for electronic circuitry and contaminant particles on a surface;

b) providing forming a liquid film on the substrate and drying solvent in the liquid to provide a dried unpatterned a solid sacrificial film on the substratesaid surface;

c) transferring energy to physically remove said dried unpatterned sacrificial film from the substratesaid surface, wherein removing said sacrificial film facilitates cleaning removing said contaminant particles from the substratesaid surface.

38. (currently amended): The method as recited in claim 37, wherein said dried material sacrificial film comprises an organic material.

39. (currently amended): The method as recited in claim 38, wherein said dried organic sacrificial film material comprises resist or collodion.

40. (currently amended): The method as recited in claim 37-12, wherein said transferring energy step (c) comprises irradiating said film with light comprises a laser.

41. (currently amended): The method as recited in claim 40, wherein said irradiating said film with light step comprises shining a laser on said film comprises an excimer laser.

42. (currently amended): The method as recited in claim 41-40, wherein said laser

comprises a pulsed UV laser.

43. (currently amended): The method as recited in claim 37, further comprising the step of measuring said contaminant particles on the substrate said surface before said step (b) of applying forming said sacrificial film.

44. (currently amended): The method as recited in claim 43, wherein said measurement step (a) measuring of said contaminant particles on said surface is performed by an advanced patterned wafer inspection system with an automatic defect classification program comprises computer software defect classification.

45. (canceled)

46. (currently amended): The method as recited in claim 43, wherein said measurement measuring provides comprises measuring of type, size, composition, density, or position coordinates of said contaminant particles on the substrate said surface.

47. (currently amended): The method as recited in claim 46, wherein said measuring of composition measurement comprises analyzing exhaust gas after cleaning removing said contaminant particles from the substrate said surface.

48. (currently amended): The method as recited in claim 46, wherein said measuring of composition measurement comprises performing x-ray dispersive spectroscopy of said contaminant particles on the substrate said surface.

49. (currently amended): The method as recited in claim 43, further comprising the step of selecting a parameter of said providing step (b) forming a sacrificial film or of said transferring of energy step (e) based on data from said measuring of said contaminant particles on the substrate step.

50. (currently amended): The method as recited in claim 49, wherein said selecting a parameter step comprises selecting a parameter based on type of particle or composition of said contaminant particles.

51. (currently amended): The method as recited in claim 50, wherein said selecting a parameter step comprises selecting a wavelength said energy to be transferred that is to be higher than that required to break bonds.

52. (currently amended): The method as recited in claim 43, wherein said measurement step-measuring comprises providing a map of said contaminant particles on the substrate said surface.

53. (currently amended): The method as recited in claim 43, wherein said transferring of energy step (e) comprises aiming an energy beam at said position coordinates locations found in-by said measuring of said contaminant particles step.

54. (currently amended): The method as recited in claim 53, wherein said energy beam comprises a laser beam and wherein said method further comprises the step of selecting a contaminant-specific recipe of for said laser cleaning induced removing of said contaminant particles step based on data from said measuring of said contaminant particles on the substrate step.

55. (currently amended): The method as recited in claim 54, wherein said method further comprises the step of setting said laser with selecting a generic recipe for laser induced cleaning removing of other major defects found in said measuring step.

56. (currently amended): The method as recited in claim 54, wherein said contaminant-specific recipe is selected for each specific type of said contaminant particle characterized in said measuring step and wherein said selective laser cleaning beam is directed to locations position coordinates on the said surface the wafer where said specific contaminant

particles are actually located as determined in said measuring-step.

57. (currently amended): The method as recited in claim 43, further comprising the step of storing data generated by said measurement measuring in a data record for said surface.

58. (currently amended): The method as recited in claim 43, further comprising measuring the step of providing a second measurement of remaining contaminant particles on the substrate said surface after said cleaning step (e) transferring of energy

59. (currently amended): The method as recited in claim 58, further comprising repeating said transferring of energy to remove said remaining contaminant particles the step of providing a second cleaning step if particles are found in said second measurement step.

60. (currently amended): The method as recited in claim 37, wherein in said providing a substrate step (a) said substrate is provided after a step in a process flow of fabricating the electronic circuitry on the substrate said surface but before other fabrication steps are complete.

61. (currently amended): The method as recited in claim 37, wherein said transferring of energy step (e) comprises an area cleaning.

62. (currently amended): The method as recited in claim 61, wherein said area cleaning is performed by providing a laser beam and scanning said laser beam or by scanning said substrate with respect to said laser beam.

63. (currently amended): The method as recited in claim 37, wherein the substrate is selected from a group consisting comprises of a semiconductor wafer or and a mask.

64. (withdrawn) An apparatus for processing a substrate, comprising:

- a particle measuring device for measuring particles on the substrate;
- an apply tool for applying a film on the substrate;
- a device that automatically selects parameters for cleaning the substrate based on information about the particles obtained by the particle measuring device; and
- a substrate cleaning tool for cleaning the substrate with the parameters so selected.

65. (new): A method for removing contaminant particles from a surface of a wafer comprising:

- transferring said wafer among a plurality of processing stations under computer control in a predetermined sequence starting at an input station and ending at an output station;

- identifying and characterizing contaminant particles on said wafer surface at at least one of said processing stations and creating a record of said contaminant particles data for said wafer at said at least one processing station, wherein said identifying and characterizing of said contaminant particles on said wafer is performed by an advanced patterned wafer inspection system with an automatic defect classification program;

- transferring said contaminant particles data to a wafer cleaning station;

- transferring said wafer to said wafer cleaning station;

- performing cleaning of said wafer, wherein said wafer cleaning station is adapted to selectively shine light at said contaminant particles based on said contaminant particles data; and

- transferring of cleaned wafer to an output station.

66. (new): The method of claim 65 wherein said light comprises a laser and said cleaning comprises laser cleaning.

67. (new): The method of claim 65 wherein said laser is selected from a group consisting of pulsed UV lasers and excimer lasers.

68. (new): The method of claim 65 wherein said contaminant particles data comprise position coordinates, type, composition, density and size of each particle contaminant on said wafer.

69. (new): The method of claim 65 wherein identifying and characterizing of said contaminant particles on said wafer is performed by equipment selected from a group consisting of a scanning electron microscope, an optical microscope, and an atomic force microscope.

70. (new): The method of claim 66 wherein said laser cleaning of said wafer comprises laser cleaning based on generic recipes.

71. (new): The method of claim 66 wherein said laser cleaning of said wafer comprises laser cleaning based on contaminant-specific recipes.